

**AMENDMENTS TO THE CLAIMS**

- 1       1. (Currently Amended) A serial communications system comprising:
  - 2           a scrambler for converting original received data into scrambled data; and
  - 3           an ECC encoder for converting said scrambled data into ECC-encoded data.
- 1       2. (Original) The system as recited in Claim 1, further comprising:
  - 2           a serializer for converting said ECC-encoded data into serialized data;
  - 3           wherein the ECC-encoded data includes frame alignment information; and
  - 4           the system further comprises a receiver for receiving said serialized data and
  - 5           converting the serialized data into data frames based upon the frame alignment information.
- 1       3. (Original) The system as recited in Claim 2, wherein the receiver comprises:
  - 2           a frame-recoverer for converting said serialized data into data frames;
  - 3           an ECC decoder for converting said data frames into ECC-decoded data and
  - 4           error indications; and
  - 5           a scrambler for converting said ECC-decoded data into de-scrambled data.
- 1       4. (Original) The system as recited in Claim 5, wherein said frame-recoverer uses  
2       said error indications in converting said serialized data into data frames.
- 1       5. (Original) The system as recited in Claim 1, wherein said ECC encoder applies an  
2       error correction code in converting said scrambled data into said ECC-encoded data.
- 1       6. (Currently Amended) A serial communications method, comprising the steps of:
  - 2           converting original received data into scrambled data; and
  - 3           converting said scrambled data into ECC-encoded data.

1       7. (Original) The method as recited in Claim 6, further comprising the steps of:  
2                   generating a serial stream of the ECC-encoded data; and  
3                   transmitting said serial stream.

1       8. (Original) The method of Claim 7, wherein:  
2                   the ECC-encoded data includes frame alignment information; and  
3                   the method further comprises receiving said serialized data and converting  
4        said serialized data into data frames based upon said frame alignment information.

1       9. (Original) The method of Claim 7, further comprising:  
2                   receiving said serialized data;  
3                   converting said serialized data into data frames;  
4                   converting said data frames into ECC-decoded data and error indications; and  
5                   converting said ECC-decoded data into de-scrambled data.

1       10. (Original) The method of Claim 9, wherein the step of converting the serialized  
2        data comprises converting the serialized data into data frames based upon said error  
3        indications.

1       11. (Withdrawn) A serial communications system comprising:  
2                   an ECC decoder for converting data frames into ECC-decoded data; and  
3                   a de-scrambler for converting said ECC-decoded data into de-scrambled data.

1       12. (Withdrawn) The system of Claim 11, further comprising a frame-recoverer for  
2        converting serialized data into said data frames.

1       13. (Withdrawn) The system as recited in Claim 12, wherein:  
2                   said ECC decoder generates error indications; and

3                   said frame-recoverer uses said error indications in converting said serialized  
4    data into said data frames.

1               14. (Withdrawn) The system as recited in Claim 13, wherein said frame-recoverer  
2    generates a frame clock that is shifted in phase based upon said error indications, said frame-  
3    recoverer converting said serialized data into said data frames using said frame clock.

1               15. (Withdrawn) The system as recited in Claim 14, wherein said frame-recoverer  
2    shifts in phase said frame clock by a predetermined number of periods of a bit clock based  
3    upon said error indications.

1               16. (Withdrawn) The system as recited in Claim 13, wherein said frame-recoverer  
2    comprises:

3                   a plurality of registers, each register being controlled to receive said serialized  
4    data and form two or more frames of parallel data therefrom;

5                   a selection control circuit for receiving said error indications and generating at  
6    least one control signal; and

7                   selection circuitry coupled to receive as inputs the output of said registers and  
8    said control signal from said selection control circuit, and output a set of parallel data  
9    appearing at the input of said selection circuitry, said number of bits in said set of parallel  
10   data corresponding to the number of bits in a frame of data.

1               17. (Withdrawn) The system as recited in claim 16, wherein

2                   the selection circuitry comprises a plurality of individual multiplexer circuits,  
3    the number of multiplexer circuits corresponding to the number of bits n in a frame of data,  
4    each multiplexer circuit being an n+1:1 multiplexer circuit.

1           18. (Withdrawn) The system as recited in Claim 13, wherein said error indications  
2    are associated with errors in said data frames, said ECC-decoder correcting some of said  
3    errors.

1           19. (Withdrawn) A serial communications system comprising:  
2                an ECC decoder for converting data frames into ECC-decoded data and error  
3    indications; and  
4                a frame recoverer for converting serialized data into said data frames using  
5    said error indications.

1           20. (Withdrawn) The system as recited in Claim 19, wherein said frame-recoverer  
2    generates a frame clock that is shifted in phase based upon said error indications and converts  
3    said serialized data into said data frames using said frame clock.

4           21. (Withdrawn) The system as recited in Claim 20, wherein said frame-recoverer  
5    shifts in phase said frame clock by a predetermined number of periods of a bit clock based  
6    upon said error indications.

1           22. (Withdrawn) The system as recited in Claim 19, wherein said frame-recoverer  
2    comprises:

3                a plurality of registers, each register being controlled to receive said serialized  
4    data and form two or more frames of parallel data therefrom;

5                a selection control circuit for receiving said error indications and generating at  
6    least one control signal; and

7                selection circuitry coupled to receive as inputs the output of said registers and  
8    said control signal from said selection control circuit, and output a set of parallel data

9 appearing at the input of said selection circuitry, the number of bits in said parallel set of data  
10 corresponding to the number of bits in a frame of data.

1 23. (Withdrawn) The system as recited in claim 22, wherein  
2 the selection circuitry comprises a plurality of individual multiplexer circuits,  
3 the number of multiplexer circuits corresponding to the number of bits n in a frame of data,  
4 each multiplexer circuit being an n+1:1 multiplexer circuit.

5 24. (Withdrawn) The system as recited in Claim 19, wherein said error indications  
6 are associated with errors in said data frames, said ECC-decoder correcting some of said  
7 errors.

1 25. (Withdrawn) The system as recited in claim 19, further comprising:  
2 a de-scrambler for converting said ECC-decoded data into de-scrambled data.

1 26. (Original) A serial communications method comprising:  
2 converting serialized data into data frames as a function of error indications;  
3 and  
4 converting said data frames into ECC-decoded data and said error indications.

1 27. (Withdrawn) The method as recited in Claim 26, further comprising:  
2 de-scrambling said ECC-decoded data into de-scrambled data.

1 28. (Withdrawn) The method as recited in Claim 26, wherein the step of converting  
2 said serialized data comprises:  
3 generating a frame clock that is shifted in phase based upon said error  
4 indications; and  
5 converting said serialized data into said data frames using said frame clock.



1        29. (Withdrawn) The method as recited in claim 26, wherein the step of converting  
2        said serialized data comprises:

3                temporarily maintaining bits of said serialized data sufficient to form two or  
4        more frames of parallel bits;

5                selecting a frame of data from said maintained bits based upon said error  
6        indications, said frame of data being a frame of data in the data frames; and

7                repeating said steps of temporarily maintaining and selecting for generating  
8        each data frame from said serialized data.

1        30. (Withdrawn) The method as recited in claim 26, further comprising:

2                initially scrambling received data into scrambled data;

3                converting said scrambled data into ECC-encoded data; and

4                converting said ECC-encoded data into said serialized data.

1        31. (Withdrawn) A serial communications method comprising:

2                converting data frames into ECC-decoded data and error indications; and

3                de-scrambling said ECC-decoded data into de-scrambled data.

1        32. (Withdrawn) The method as recited in Claim 31, further comprising:

2                initially converting serialized data into said data frames as a function of said  
3        error indications.

1        33. (Withdrawn) The method as recited in claim 31, further comprising:

2                initially scrambling received data into scrambled data; and

3                performing an ECC encoding operation on said scrambled data to generate said  
4        data frames.

1                   34. (New) A serial communication system comprising:  
2                   a scrambler for converting received data into scrambled data, said received data  
3                   being without redundant bits inserted by said serial communication system; and  
4                   an ECC encoder for converting said scrambled data into ECC-encoded data.